

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 987 894 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
19.04.2000 Bulletin 2000/16

(51) Int Cl.7: H04N 7/24, H04L 12/64

(43) Date of publication A2:
22.03.2000 Bulletin 2000/12

(21) Application number: 99304426.2

(22) Date of filing: 08.06.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: XU, Jinghong
Singapore 760247 (SG)

(74) Representative: Crawford, Andrew Birkby et al
A.A. Thornton & Co.
235 High Holborn
London WC1V 7LE (GB)

(30) Priority: 07.09.1998 SG 9803578

(71) Applicant: VICTOR COMPANY OF JAPAN, LTD.
Yokohama-Shi, Kanagawa-Ken (JP)

(54) A dejittering and clock recovery technique for real-time audio/visual network applications

(57) In a real-time audio/visual system in which A/V data is conveyed over a jitter-introducing network, dejittering and clock recovery processes can be achieved without requiring a Phase Locked Loop (PLL). At the server, audio/video streams are encoded into transport packets before being sent out. At the client, the dejittering process is achieved by a dejittering buffer using the embedded timestamps in the transport packets and a client decoding clock. The delay variations of data arriving are removed after the client buffering process. At the

scheduled time, each data packet is shifted to a synchronizing buffer and then fed to the A/V decoder according to the speed of A/V stream. The clock synchronization between client and server is achieved by a synchronizing buffer whose half-size position is taken as the reference. By monitoring the movement of the buffer fill position over a given period, the drift rate of clock unsynchronization between client and server can be derived and, therefore, the client's clock can be adjusted to synchronize with the server's clock based on the derived drift.

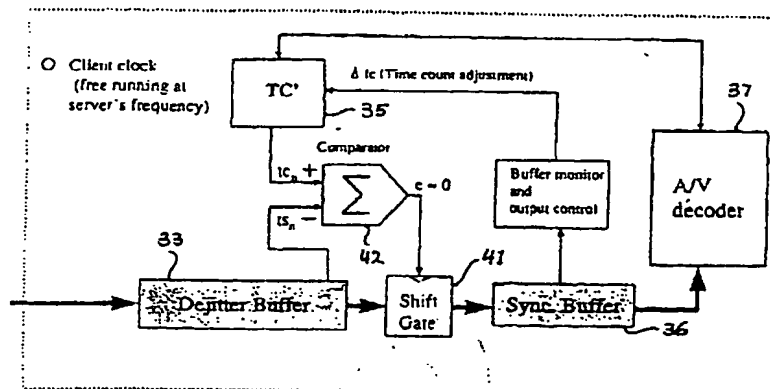


Figure 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 4426

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|---|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| X | US 5 633 871 A (BLOKS RUDOLF H J) 27 May 1997 (1997-05-27) | 5 | H04N7/24 H04L12/64 |
| A | * abstract * * column 4, line 21 - line 37 * * column 5, line 14 - column 6, line 6 * | 1,3,10 | |
| A | WO 95 22233 A (BESSETTE FRANCOIS ;NEWBRIDGE NETWORKS CORP (CA)) 17 August 1995 (1995-08-17) * page 2, line 29 - page 4, line 19 * * page 5, line 30 - page 6, line 22 * | 1,2,4-7, 10,11 | |
| A | PALACHARLA S ET AL: "DESIGN AND IMPLEMENTATION OF A REAL-TIME MULTIMEDIA PRESENTATION SYSTEM USING RTP" PROCEEDINGS OF THE ANNUAL INTERNATIONAL COMPUTER SOFTWARE AND APPLICATIONS CONFERENCE (COMPSAC),US,LOS ALAMITOS, IEEE COMP. SOC. PRESS, vol. CONF. 21, 1997, pages 376-381, XP000740025 ISBN: 0-8186-8106-3 * paragraph '0004' * | 1,5-9 | |
| A | US 5 790 543 A (CLOUTIER LEO) 4 August 1998 (1998-08-04) * abstract * * column 9, line 35 - column 11, line 29 * | 1-3,5,10 | H04N H04L |
| A | EP 0 712 250 A (SONY CORP) 15 May 1996 (1996-05-15) * abstract * | 1,2,5,6, 10,11 | |
| A | US 5 640 388 A (HAMMOND MAYNARD D ET AL) 17 June 1997 (1997-06-17) * abstract * | 1,5,10 | |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 29 February 2000 | Examiner Marie-Julie, J-M |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p> | | | |

EPO FORM 1500 03-82 (P04001)